

PCT COOPERATION TREATY

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NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE
 in its capacity as elected Office

Date of mailing (day/month/year) 10 January 2001 (10.01.01)	
International application No. PCT/EP00/03723	Applicant's or agent's file reference SIPA/99/192
International filing date (day/month/year) 26 April 2000 (26.04.00)	Priority date (day/month/year) 04 June 1999 (04.06.99)
Applicant PAVANETTO, Jader	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

11 December 2000 (11.12.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer R. E. Stoffel Telephone No.: (41-22) 338.83.38
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TENT COOPERATION TREATY

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INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference SIPA/99/192	FOR FURTHER ACTION		see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/EP 00/ 03723	International filing date (day/month/year) 26/04/2000	(Earliest) Priority Date (day/month/year) 04/06/1999	
Applicant SIPA S.P.A.			

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1
☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/EP 00/03723

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

Hydraulic press apparatus with a lower plate (1) and an upper moving plate (2), a hollow cylinder (7) under the lower plate (1), a guide column (10) joined on top to the upper plate (2) and with a lower end portion forming the rod of a piston (13) adapted to slide in the hollow cylinder (7), an aperture (15) in the side surface of the hollow cylinder adapted to connect the inner volume existing above the piston (13) with means (17) that are adapted to apply a hydraulic pressure within said inner volume. The guide column (10) is provided with a cylindrical cavity (18) filled with oil, extending all along the interior of the piston (13) and coming out of the latter from the lower portion thereof. There is provided a plunger-type piston that is arranged to slide within said cylindrical cavity and is provided with an upper cylindrical portion (20) that plugs said inner cavity, and with a lower portion (21) having a smaller diameter. A through-bore (22) connects the inner cylindrical cavity (18) with said inner volume (16) when the upper cylindrical portion (20) of the plunger-type piston is displaced under the level of said through-bore.

(19) World Intellectual Property Organization
International Bureau



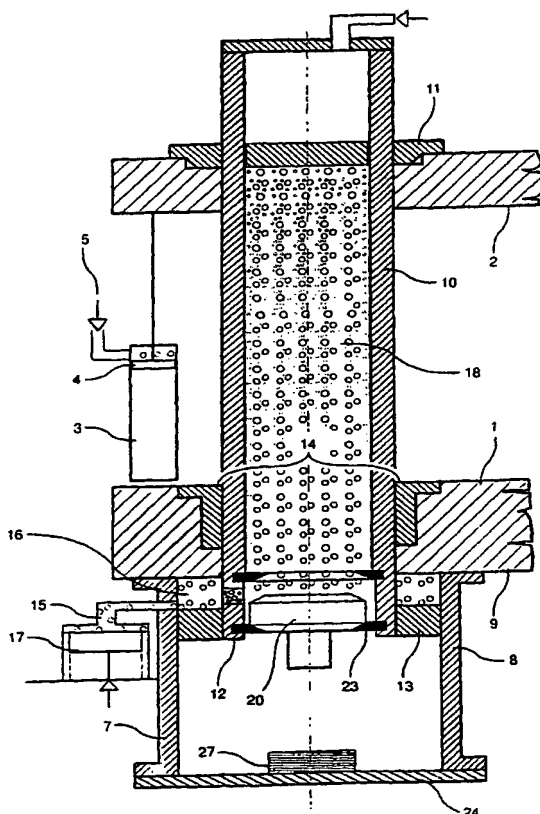
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PN99A000047 4 June 1999 (04.06.1999) IT
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(75) Inventor/Applicant (for US only): PAVANETTO, Jader [IT/IT]; Via Isonzo, 10, I-30174 Mestre (IT).
- (74) Agents: GIUGNI, Valter et al.; Propria S.r.l., Via Mazzini, 13, I-33170 Pordenone (IT).
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- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: HYDRAULIC PRESS APPARATUS WITH IMPROVED CONTROL OF THE OLEO-DYNAMIC CIRCUIT THEREOF



(57) Abstract: Hydraulic press apparatus with a lower plate (1) and an upper moving plate (2), a hollow cylinder (7) under the lower plate (1), a guide column (10) joined on top to the upper plate (2) and with a lower end portion forming the rod of a piston (13) adapted to slide in the hollow cylinder (7), an aperture (15) in the side surface of the hollow cylinder adapted to connect the inner volume existing above the piston (13) with means (17) that are adapted to apply a hydraulic pressure within said inner volume. The guide column (10) is provided with a cylindrical cavity (18) filled with oil, extending all along the interior of the piston (13) and coming out of the latter from the lower portion thereof. There is provided a plunger-type piston that is arranged to slide within said cylindrical cavity and is provided with an upper cylindrical portion (20) that plugs said inner cavity, and with a lower portion (21) having a smaller diameter. A through-bore (22) connects the inner cylindrical cavity (18) with said inner volume (16) when the upper cylindrical portion (20) of the plunger-type piston is displaced under the level of said through-bore.

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10 **HYDRAULIC PRESS APPARATUS WITH IMPROVED CONTROL OF THE
OLEO-DYNAMIC CIRCUIT THEREOF**

DESCRIPTION

15 The present invention refers to a vertical hydraulic press apparatus adapted to most efficiently and effectively cause complementary half-moulds to clamp together in both processes used to form metal materials and, in particular, in processes aimed at injection-moulding and forming thermoplastic materials.

20 A very wide variety and types of hydraulic press apparatuses are largely known to be currently available and in practical use. Anyway, it can be easily noticed that the simplicity in the overall construction of such machines and an as easy and effective as possible control of the operations thereof are among the most common requirements that engineers tend to comply with when designing these presses.

25

 The basic schematic layout of a hydraulic press apparatus used for clamping half-moulds in injection-moulding processes for forming thermoplastic materials generally includes a guide column associated to a piston adapted to slide within a hydraulic cylinder. When the upper half-mould is moved vertically with respect to
30 the stationary lower half-mould, the hydraulic fluid that finds itself on a side of the piston is partially transferred, owing to the displacement of the piston itself, to the other side of the piston through an external circuit and at least a controlled valve.

The presence of such an external circuit, however, implies the installation of a number of mechanical component parts and further requires a lot of precision machining operations to be performed. Such a need, along with the requirement for said valve and the related control circuits to be so provided, makes the construction
5 of such a press apparatus particularly complicated, expensive and demanding, and also quite delicate in its operation.

US-A-5 204 047 and US-A-5 302 108 are known to teach a method for making a particular type of hydraulic press apparatus using a support column for said pistons
10 so as to minimize the overall space requirements of the press, wherein the peculiarity of this press apparatus lies in its being provided with a plurality of pistons associated to a stationary differential piston.

Although the main purpose of said patents is actually reached with such a
15 solution, also the so obtained press apparatus, however, turns out as being too complicated and expensive in its construction and delicate in its operation, owing particularly to the really large number of hydraulic conduits that need to be closed and opened in a synchronized pattern.

20 It is therefore a main purpose of the present invention to provide a vertical hydraulic press apparatus, particularly adapted for use in connection with plastic moulding processes, which is compact, reliable in its operation, uses low-cost materials, construction requirements and component parts, and has a simple and reliable construction based on the use of readily available techniques.

25

Such a type of press apparatus is obtained and implemented with the features that are substantially described with particular reference to the appended claims.

Anyway, features and advantages of the present invention can more readily be
30 understood from the description that is given below by way of non-limiting example with reference to the accompanying drawings, in which:

- Figures 1 through to 11 are schematical, vertical-section views of a press

apparatus according to the present invention, during as many successive operating phases thereof;

With reference to the above Figures, the press apparatus according to the present invention comprises:

- a lower plate 1 and an upper plate 2 on which appropriate moulds (not shown) are applied;
- 10 - an actuation apparatus connected to said two plates and comprising a cylinder 3, a piston 4 and two conduits 5 and 6 adapted to selectively pump hydraulic fluid into the two volumes of said cylinder that are delimited and separated from each other by said piston;
- 15 - a hollow cylinder 7 provided under said lower plate and arranged with its axis extending vertically, said cylinder having its upper edge 8 arranged so as to tightly fit against the lower surface 9 of said lower plate 1;
- a guide column 10 connected with an appropriate connection means 11 to said upper plate and forming with its lower end portion 12 the rod of a piston 13 adapted to slide within said hollow cylinder 7, so that the entire guide column is able to be driven to move vertically;
- 20 - a bore 14 extending throughout said lower plate and adapted to accommodate said vertically sliding guide column;
- an aperture 15 provided in the side surface of said hollow cylinder 7 and adapted to enable the inner volume 16, which is provided above said piston, to communicate with appropriate means 17 adapted to apply a hydraulic pressure into said inner volume 16 when said piston 13 is in its lower position.
- 30

Anyway, what has been just described above belongs to the state of the art and has only been reminded here for reasons of better understanding.

According to the present invention, said guide column is provided with an inner cylindrical cavity 18 having its axis extending parallelly to the direction of displacement of the column and opening at the lower end portion 19 of the same column.

Inside said cylindrical cavity 18 there is arranged a sliding piston of the plunger type, which is formed by an upper cylindrical portion 20 and a lower portion 21.

Said upper cylindrical portion is so sized as to be able to plug said inner cylindrical cavity 18, while anyway allowing said piston to slide; moreover, the lower portion 21 of the piston is so sized as to extend downwards by a definite level, which shall be explained in greater detail further on, with respect to the upper portion, and has a width that is smaller than the width of the upper portion itself so that said lower portion will in no case be able to interfere with or touch the inner wall of said inner cylindrical cavity 18.

The wall of said guide column is provided, above the level of the piston 13, with a through-bore 22 that enables said inner volume 16 to communicate with said cylindrical cavity 18. It shall of course be appreciated that such a circumstance occurs when said plunger-type piston is displaced away from said through-bore, and the height of the upper portion of said plunger-type piston is furthermore at least equal to the height of said through-bore 22, so that said plunger-type piston is capable, in definite positions thereof, of shutting said through-bore, thereby interrupting the connection between said inner volume 16 and said cylindrical cavity 18.

The dimensions of the various afore described members are such that, when the piston 13 and, as a result, also the guide column are displaced in their lower position, as this is illustrated in Figures 5 and 6, the upper portion of the plunger-type piston plugs said through-bore, and when the piston 13 raises to a sufficiently high position, as this is illustrated in Figures 1, 2 and 3, the floating piston remains in a lowered position by the action of gravity and, as a consequence, leaves said

through-bore 22 open.

The operating mode, as anyone skilled in the art is at this point capable of realizing, is as follows:

5

- In a first phase (Figure 1), the guide column, and therefore also the therewith connected piston 13, is completely raised; hydraulic fluid at an appropriate pressure is let in from the conduit 5 of the cylinder 3 so as to cause the two plates 1 and 2 to move closer to each other; the floating piston is in a lowered position with respect to the through-bore 22 which, as a result, is left clear and open so as to enable the oil to flow over from the inner cylindrical cavity 18, whose volume is decreasing gradually owing to the upper plate being so caused to move downwards, to the inner volume 16 of the cylinder 7.

15

The floating piston does not fall back on to the bottom of the hollow cylinder 7, but is rather retained within said inner cylindrical cavity 18 by the action of an inner, preferably frusto-conical lower crown-like ring 23 which is arranged below said through-bore 22 and is adapted to stop said floating piston in a certain lower position thereof by interference with the upper cylindrical portion 20 thereof.

20

In an advantageous manner, also the lower edge 40 of said upper portion 20 is shaped in the form of a frustum of cone so as to be able to perfectly fit against the frusto-conical shape of said crown-like ring 23, while the combination of the position of said crown-like ring with the height of said upper portion of the floating piston is such that, when the latter is brought to rest on said crown-like ring, said through-bore remains clear and open.

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- The next, ie. second phase (Figure 2) may be considered as an intermediate oil transfer phase. Hydraulic fluid keeps being let into the piston 3 from the conduit 5 and this causes the guide column, and the related plunger-type piston, to move further downwards, while the hydraulic fluid keeps flowing over as explained above.

30

- In the third phase (Figure 3) the guide column keeps lowering until the lower surface of the lower portion 21 of the plunger-type piston enters into contact with the bottom wall 24 of the hollow cylinder 7.
- 5 - In the fourth phase (Figure 4) the guide column keeps moving downwards and, with it, also the through-bore 22 which therefore moves closer to the level of the plunger-type piston that is prevented from lowering any further by said bottom wall 24; said through-bore starts therefore to be plugged.
- 10 - In the fifth phase (Figure 5) the guide column keeps lowering down to its bottom dead point.

In this position, in which the mould (not shown) is fully clamped, the through-bore 22 moves exactly in front of the upper cylindrical portion 20 of the plunger-type piston, which therefore plugs it. As a result, any passage of hydraulic fluid
15 towards the inner volume 16 ceases.

In order to prevent even the smallest amount of hydraulic fluid from being able to seep through said through-bore into the cylindrical cavity 18 in the next
20 compression phase, there is provided a second annular, preferably frusto-conical crown 25 arranged above said through-bore 22 and adapted to stop said floating piston in a definite lower position thereof by interference with the related upper cylindrical portion 20.

25 In an advantageous manner, also the upper edge 30 of said upper portion 20 is shaped in the form of a frustum of cone so as to be able to perfectly fit against the frusto-conical shape of said upper crown-like ring 25, while the combination of the position of said upper crown-like ring with the dimensions and the position of said
30 upper portion of the floating piston is such that, when the latter is moved to its top dead point, the mating frusto-conical shapes of the upper crown-like ring 25 and the upper portion of the floating piston being so brought to fit against each other actually prevents any hydraulic fluid from seeping through the through-bore 22.

Furthermore, in order to prevent abrupt shocks and excessive pressures between said mating frusto-conical shapes there is provided an elastic element 27 on the bottom wall 24 of the hollow cylinder 7, which the lower portion of the plunger-type piston comes to lie against and which is further capable of absorbing,
5 ie. taking up any possible modest interference and/or excessive coupling pressure.

- The sixth phase of the operation (Figure 6) is the phase in which the maximum extent of compression of the hydraulic fluid is brought about in view of keeping the mould firmly clamped against the expanding pressure of the part being moulded,
10 which in fact would tend to cause the same mould to open apart. This compression is brought about by means of per se known means 17 that are adapted to most quickly set said inner volume 16 under a high pressure by acting on the hydraulic fluid through said aperture 15 in the wall of the cylinder 7.

15 In this phase, the floating piston and the guide column do not move, ie. they stand still.

- The next seventh phase (Figure 7) corresponds to the opposite sequence of the sixth phase above. In other words, the pressure generated by said means 17 is
20 released, while the guide column and the floating piston do not move yet.

- In the next eighth phase (Figure 8) the hydraulic fluid starts to be pumped into the conduit 6 of the cylinder 3 and this causes the upper plate 2, and therefore also the guide column, to move again upwards and the pressure on the elastic means 27
25 to be released by the floating piston owing to the action of also said second upper circular crown 25 being lifted jointly with the guide column.

- In the ninth phase (Figure 9) the guide column keeps raising, while the lower crown-like ring 23 is raised until it enters into contact with the lower edge of the
30 upper cylindrical portion of the floating piston, however without causing the latter to start moving upwards yet. The through-bore 22 is opened as a result of the guide column being so raised, and the hydraulic fluid within the inner volume 16 is pushed and starts to flow over into said inner cylindrical cavity 18.

- In the tenth phase (Figure 10) the guide column still keeps raising so as to cause also the floating piston to rise by pulling it upwards owing to its having so engaged the inner lower crown-like ring 23; the hydraulic fluid keeps flowing over
5 into the inner cylindrical cavity 18.

- In the last, ie. eleventh phase (Figure 11), the press regains a set-up which is similar to the one illustrated in Figure 1: the guide column and the upper plate reach the top dead center under a maximum extent of hydraulic fluid having been
10 caused to flow over by this time. From this moment on, a new cycle can therefore start from the afore cited first phase.

Furthermore, in all Figures 1 through to 11 there can be noticed the presence of a cylindrical member 33 arranged in the form of a plug over the level of the
15 hydraulic fluid in the cylindrical cavity 18. This cylindrical member 33 has the task of preventing any excessive surface vorticity, in particular during the phases in which the through-bore 22 is opened and closed; in view of promoting such a function, the volume of gas 34 above said cylindrical member is kept under a slight pneumatic pressure, preferably through an appropriate conduit 35.

20

The advantages of the present invention are now quite apparent and may be summarized as follows:

- smaller space taken up by the press apparatus owing to the maximum extent
25 of efficiency in using the inner volumes of the guide column;

- maximum extent of construction and functional simplicity deriving from the elimination of any external hydraulic circuits;

30 - elimination of the controlled valves, under significant economic advantages deriving also from the elimination of the related control and actuation circuits.

Moreover, a press apparatus according to the present invention can be

implemented with the use of materials and techniques that are readily available and fully known in the art, which furthermore show no criticism or difficulty in their utilization.

- 5 It shall be appreciated that the description and illustrations given above with reference to the accompanying drawings have been given by mere way of exemplification of the present invention, and that a number of variants and modifications can therefore be introduced thereto without departing from the scope of the present invention.

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CLAIMS

1. Hydraulic press apparatus comprising:

- a lower table (1) and an upper table (2) adapted to be driven with a vertical motion against said lower plate by means of appropriate motion and position control means (3, 4, 5, 6),
- a hollow cylinder (7) provided under said lower plate and arranged with its axis extending vertically, said cylinder having its upper edge (8) applied in a tight-fitting manner against the lower surface (9) of said lower plate (1),
- a guide column (10) connected on top to said upper plate and having its lower end portion forming the rod of a piston (13) adapted to slide within said hollow cylinder,
- a hole (14) extending throughout said lower plate (1) and adapted to accommodate said vertically sliding guide column,
- an aperture (15) provided in the side surface of said hollow cylinder (7) and adapted to enable the inner volume (16), located above said piston, to communicate with appropriate means (17) adapted to apply a hydraulic pressure within said inner volume when said piston is in its lower position, characterized in that
- said guide column is provided with an inner cylindrical cavity (18) having a vertical axis and filled with hydraulic fluid, said cylindrical cavity extending into said piston (13) and coming out of the latter at the lower end portion thereof,
- there is provided a plunger-type piston adapted to slide within said inner cylindrical cavity, said piston being provided with an upper cylindrical portion (20)

that has such a diameter as to be able to plug said inner cavity, and with a lower portion (21) that has a smaller diameter so as to prevent it from entering into contact with the walls of said inner cylindrical cavity (18),

- there is provided a through-bore (22) adapted to enable said inner cylindrical cavity (18) to communicate with said inner volume (16) when said upper cylindrical portion (20) of said plunger-type piston is situated under the level of said through-bore.

2. Hydraulic press apparatus according to claim 1, characterized in that the lengths of said two portions (20, 21) of said plunger-type piston are such that, when the piston is in its lower position, said upper cylindrical portion of said plunger-type piston is adapted to plug said through-bore (22), and when said piston is in its position corresponding to the position of greatest separation of said lower and upper plates from each other, said upper cylindrical portion of said plunger-type piston is positioned so as to at least partially clear, ie. open said through-bore.

3. Hydraulic press apparatus according to claim 2, characterized in that, when the piston is in its lower position, said lower portion (21) abuts with its lower edge against the bottom wall (24) of said hollow cylinder (7).

4. Hydraulic press apparatus according to claim 2 or 3, characterized in that:

- said upper portion (20) of said plunger-type piston is connected to said lower portion (21) thereof by means of a frusto-conical connecting portion (40),

- said inner cylindrical cavity (18) is provided inside with a frusto-conical crown-like ring (23) arranged in a position below said through-bore (22) and adapted to engage said frusto-conical connecting portion so as to prevent said plunger-type piston from further displacing downwards,

- and the height of said upper portion (20) of said plunger-type piston is not smaller than the difference in height between the upper edge of said through-bore (22) and said crown-like ring (23), so as to be able to plug said through-bore when said plunger-type piston is located above and in contact with said crown-like ring (23).

5. Hydraulic press apparatus according to any of the preceding claims 2 to 4, characterized in that

- the upper edge (30) of said upper portion of said plunger-type piston has a frusto-conical shape,

5 - said inner cylindrical cavity (18) is provided inside with a second preferably frusto-conical crown-like ring (25) arranged in a position above said through-bore and adapted to engage said upper edge (30) of said upper portion when said guide column is in its lower position.

10 6. Hydraulic press apparatus according to any of the preceding claims 3 to 5, characterized in that there is provided an elastic member (27) on the bottom wall (24) of the hollow cylinder (7), in such a position as to be able to fit between said lower portion (21) and said bottom wall (24).

15 7. Hydraulic press apparatus according to any of the preceding claims, characterized in that there is provided a cylindrical member (33) above the level of the hydraulic fluid in said cylindrical cavity (18), and that the volume (34) of gas above said cylindrical member is put under pressure preferably through an external conduit (35).

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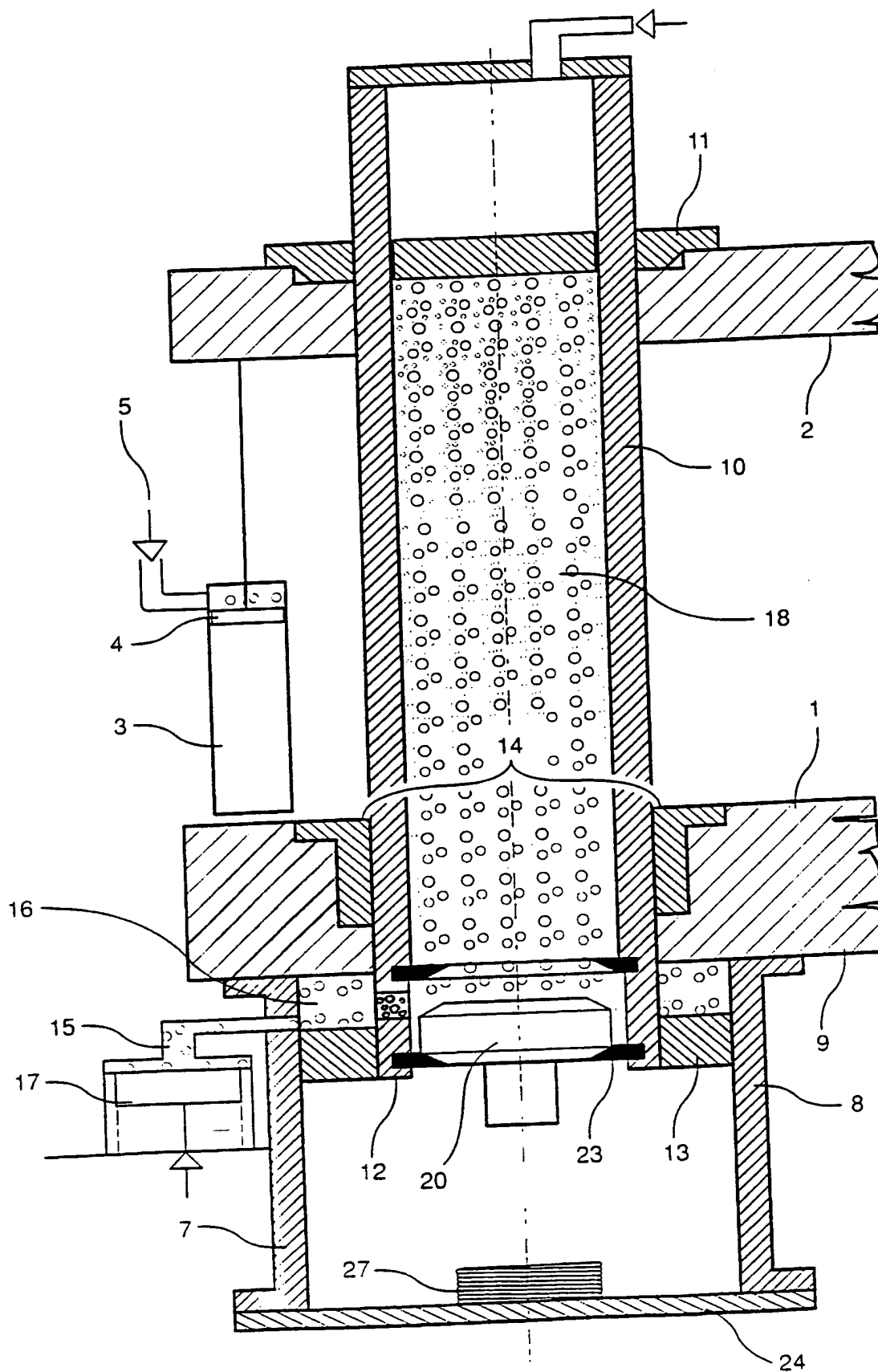


Fig.1

SUBSTITUTE SHEET (RULE 26)

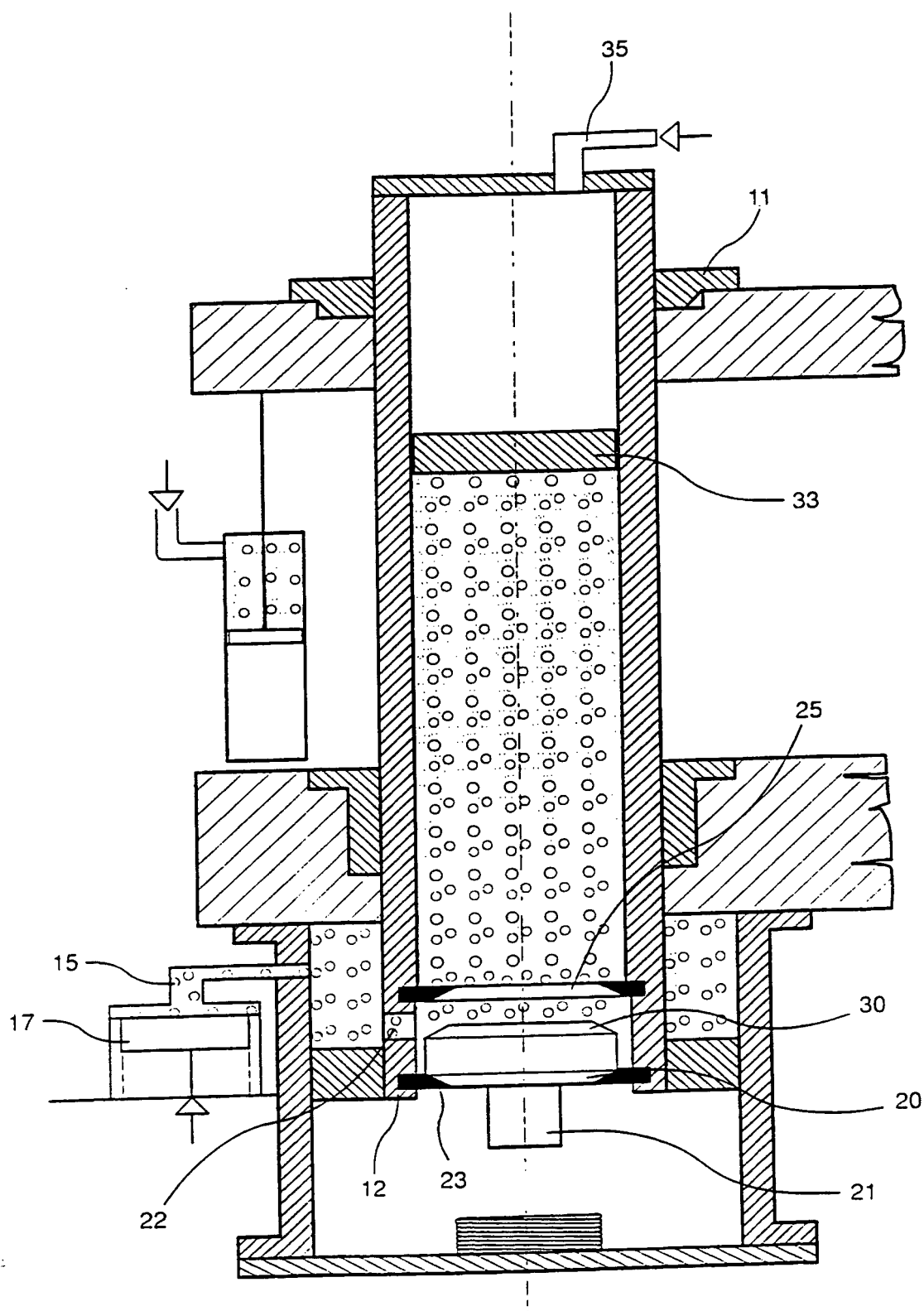


Fig. 2

SUBSTITUTE SHEET (RULE 26)

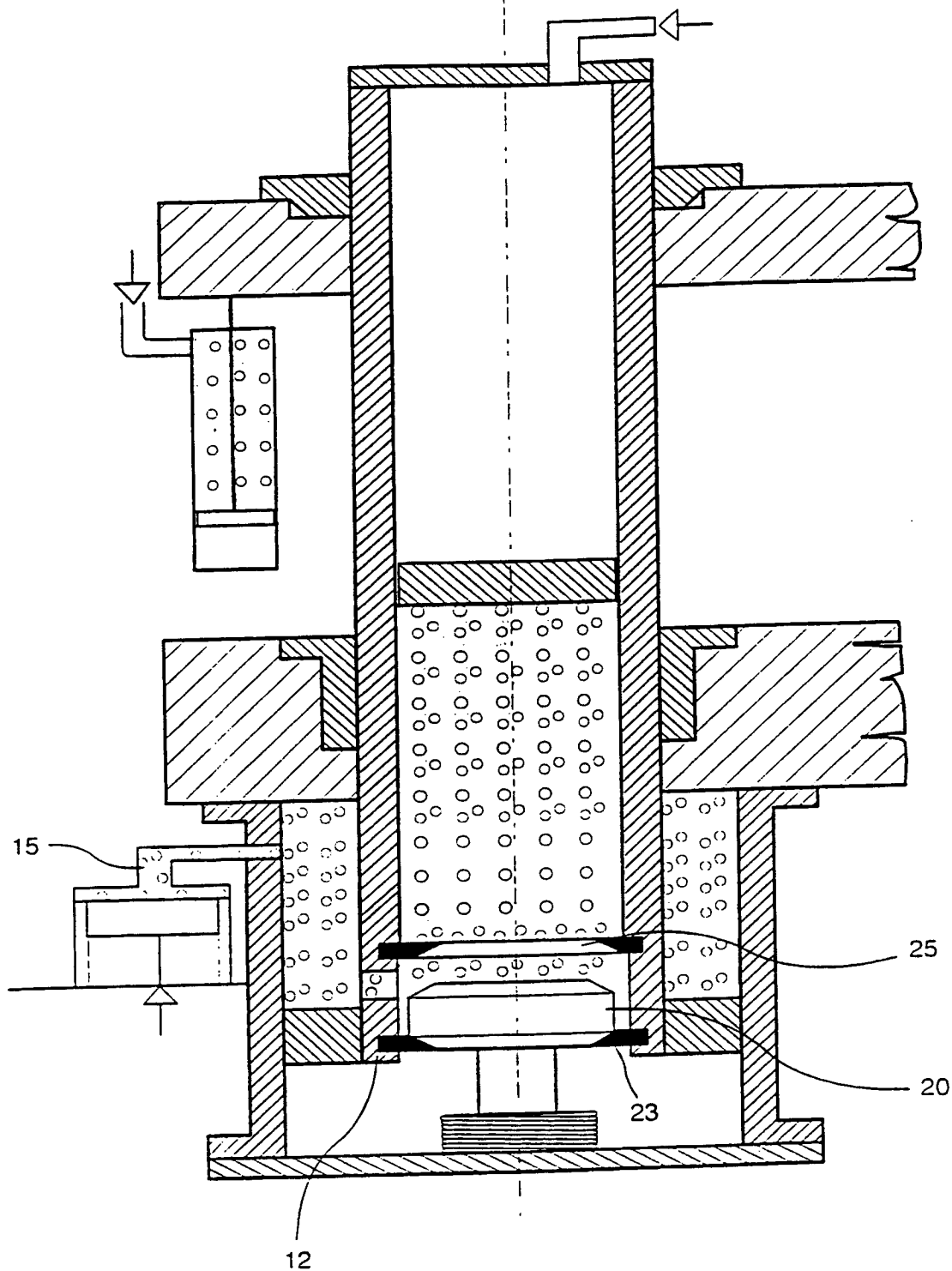


Fig. 3

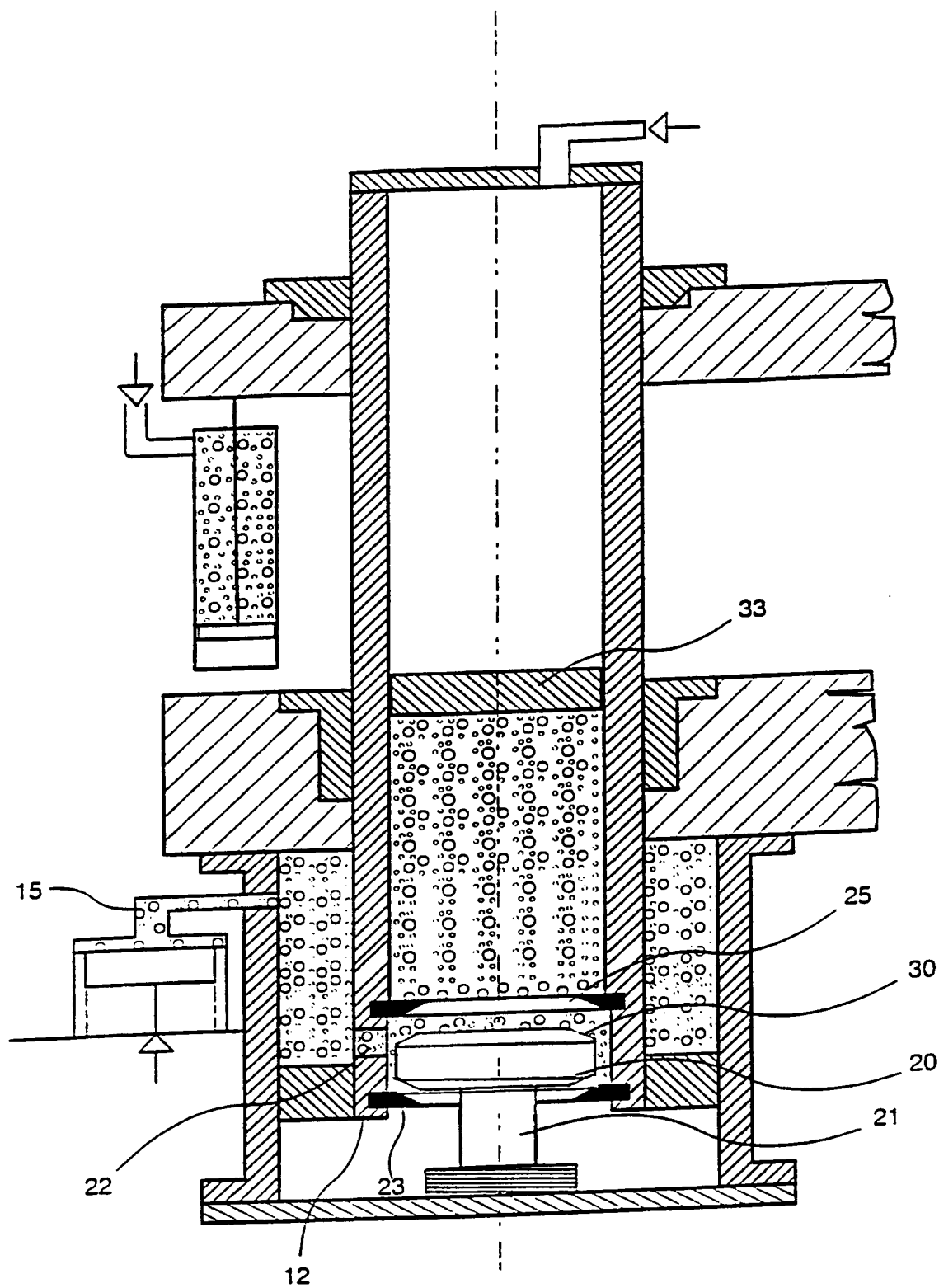


Fig. 4

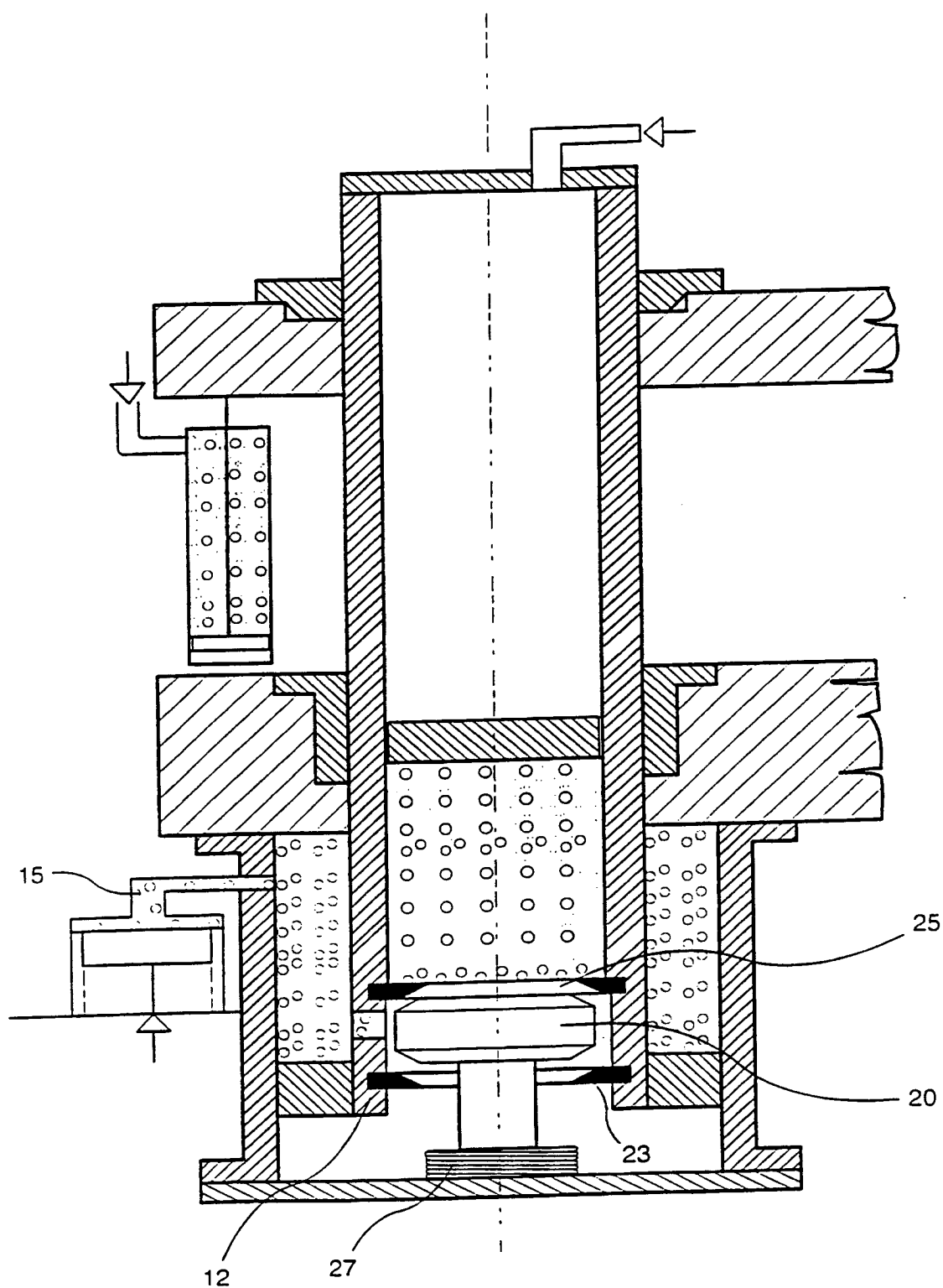


Fig. 5

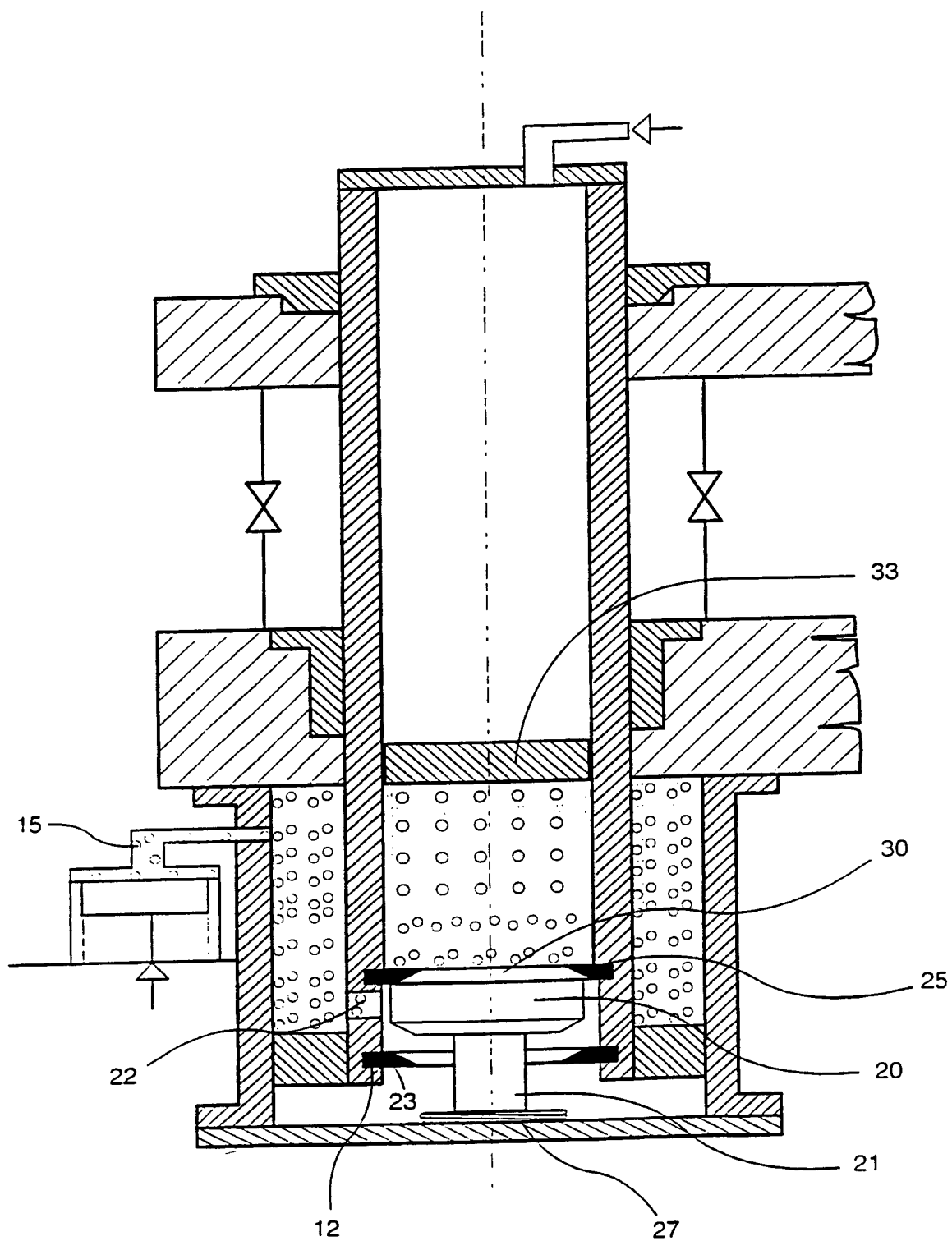


Fig. 6

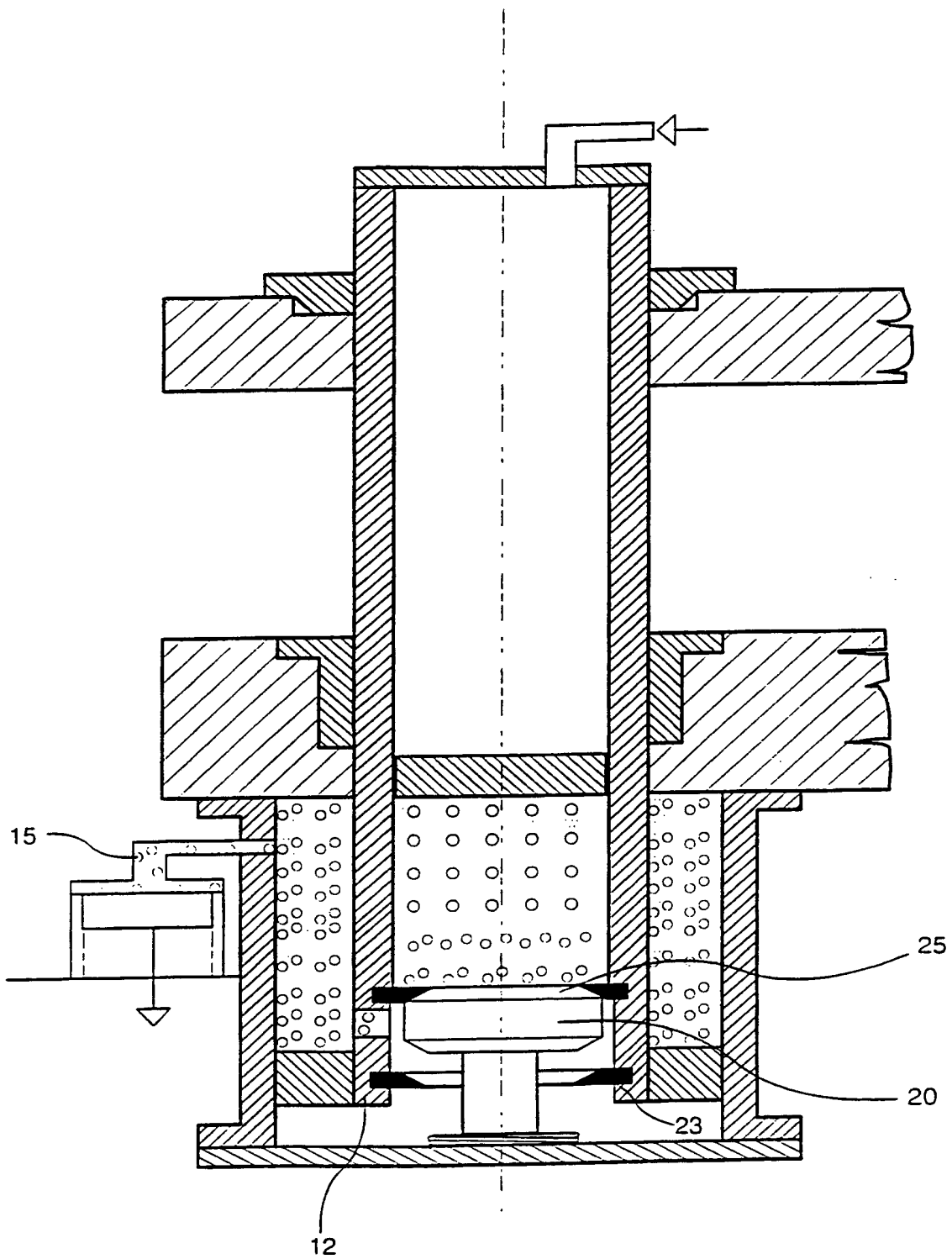


Fig. 7

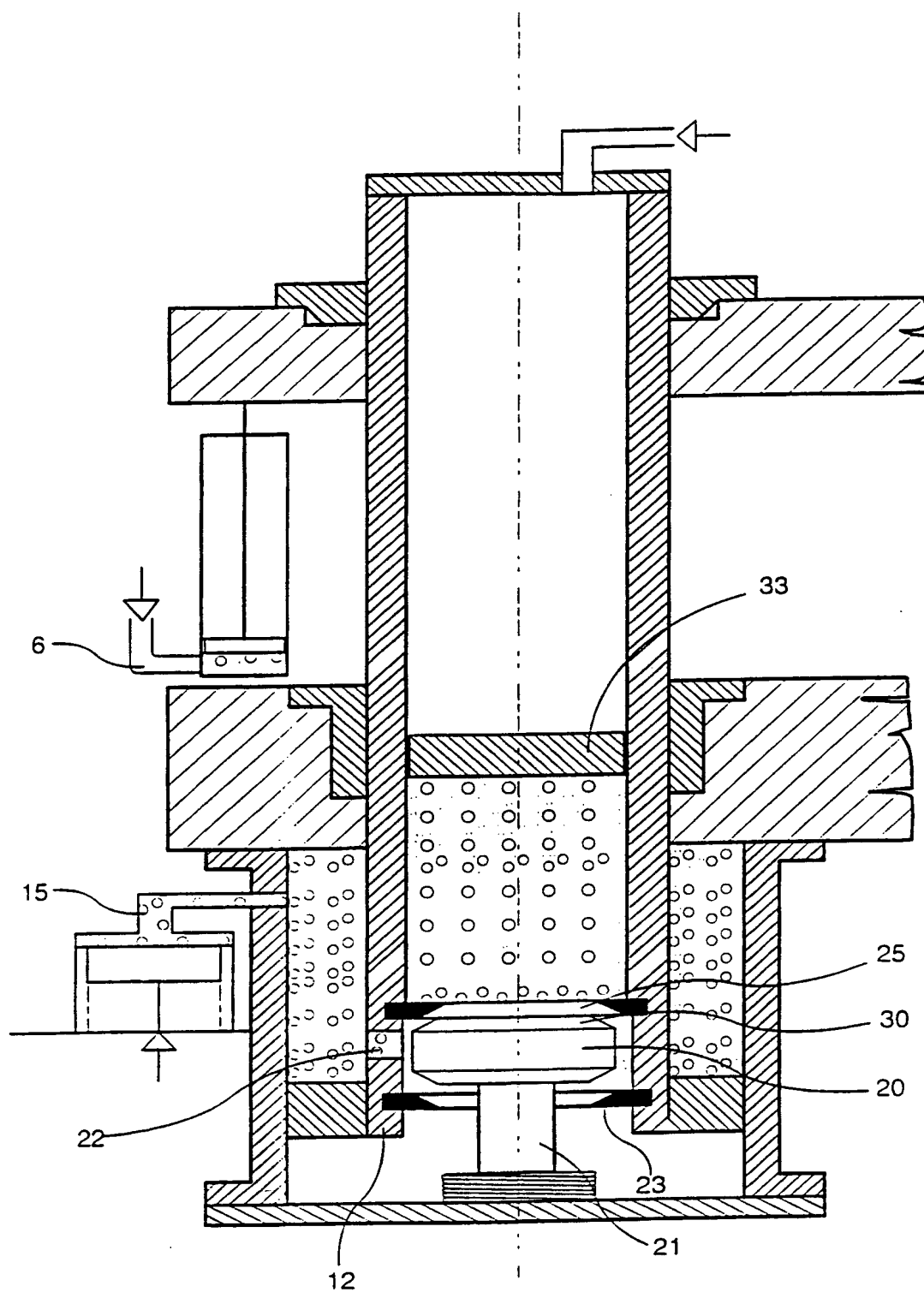


Fig. 8

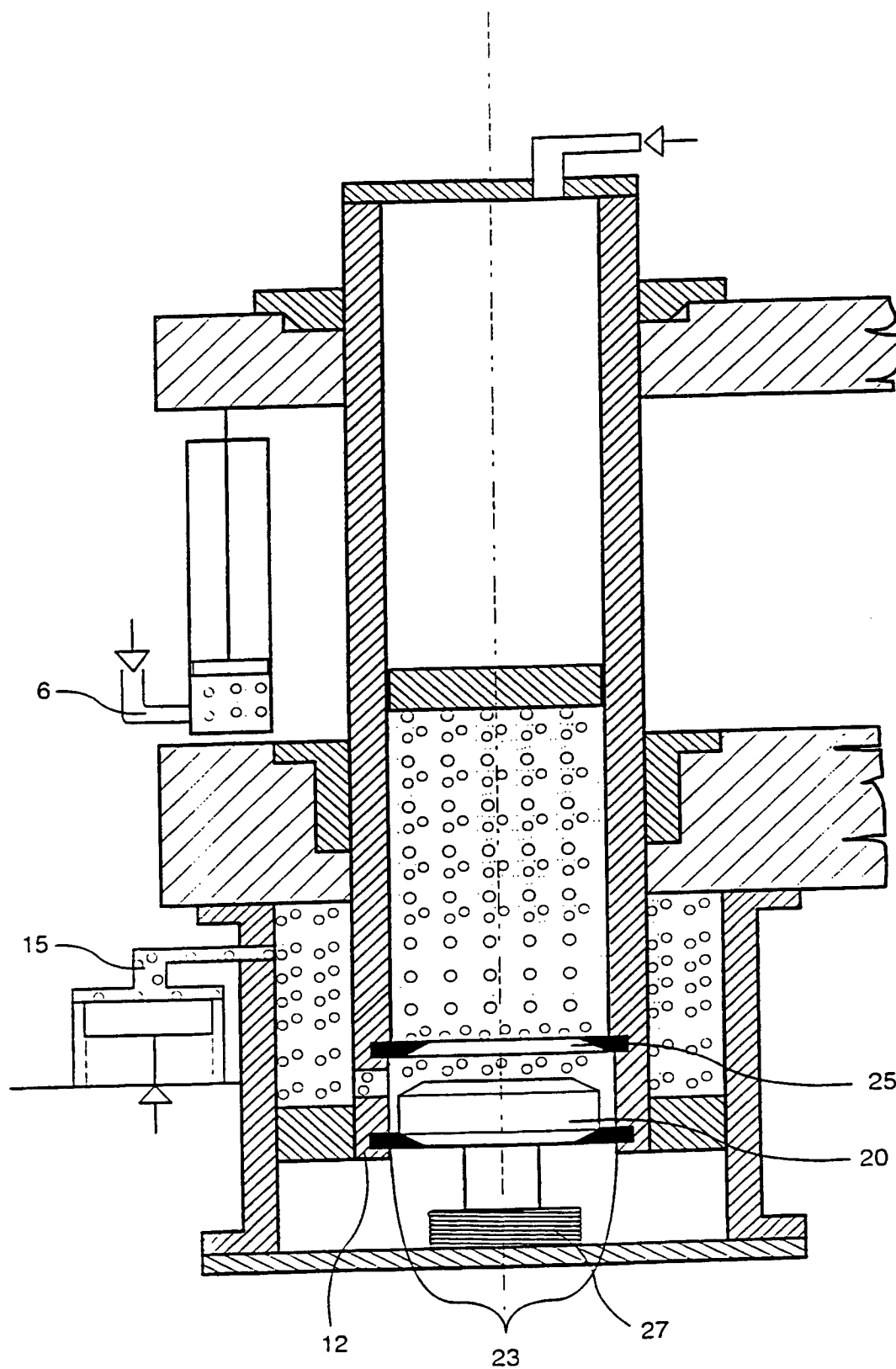


Fig. 9

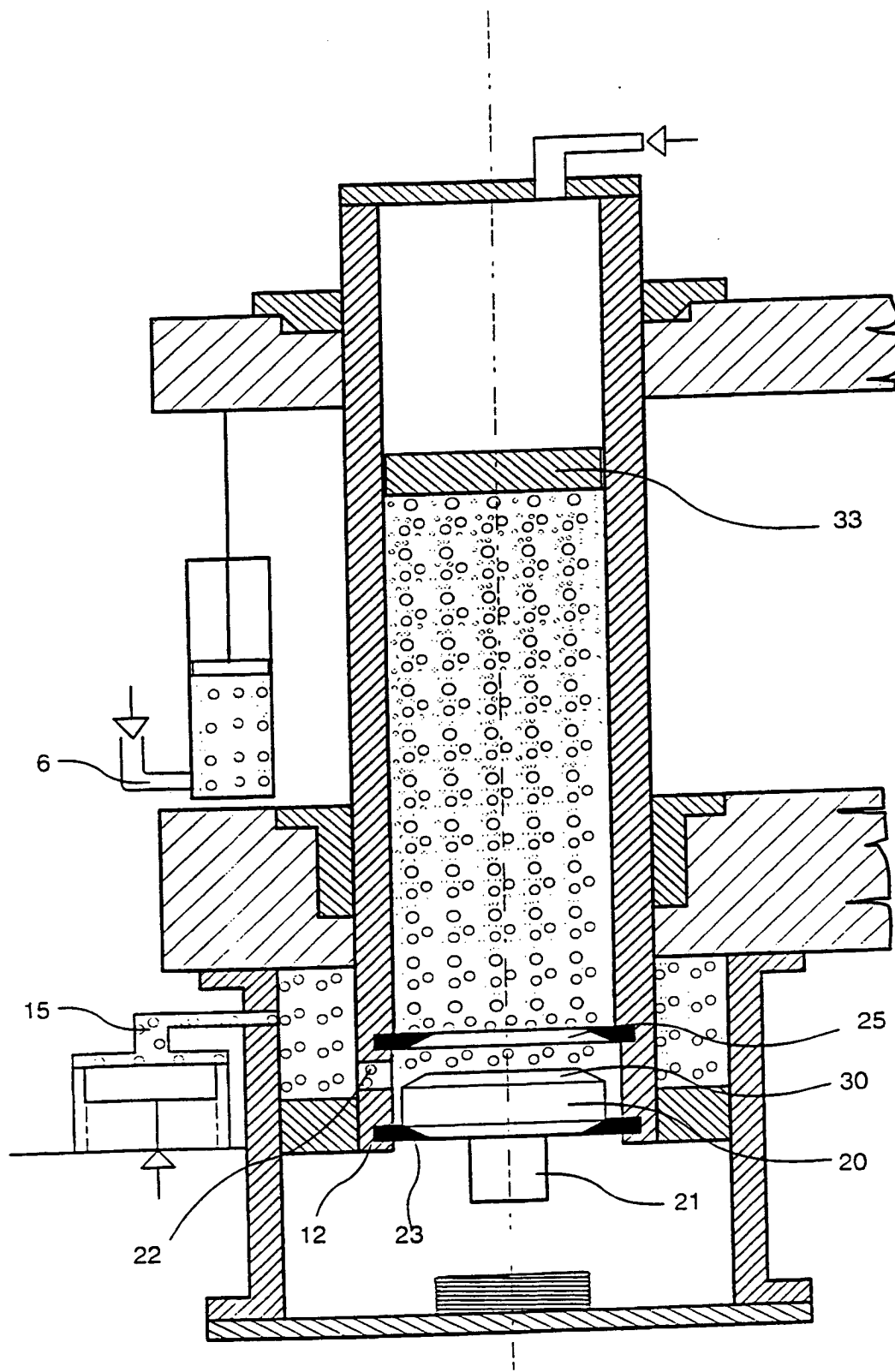


Fig. 10

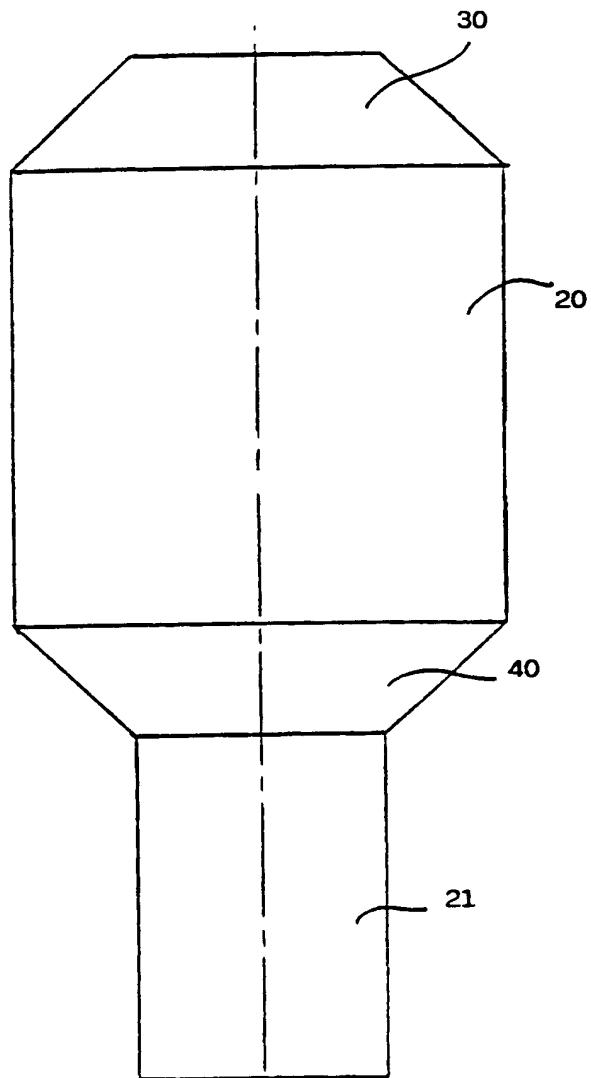


FIG. 12

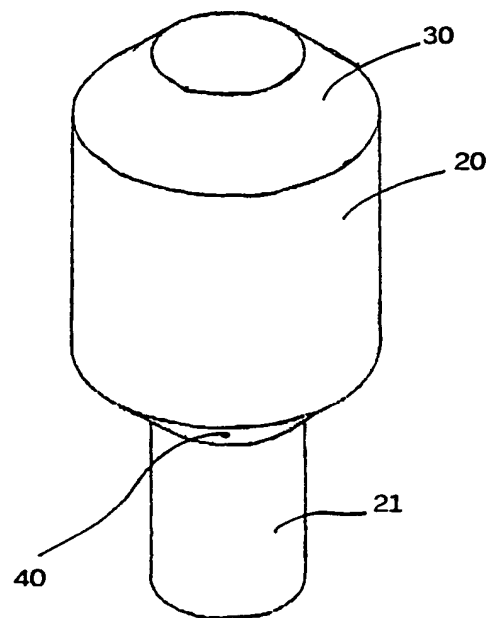


FIG. 12A

INTERNATIONAL SEARCH REPORT

Intern. Application No

PCT/EP 00/03723

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B29C45/67 F15B15/14 B30B1/32

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B29C F15B B30B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 554 662 A (TOYOTA MOTOR CO LTD) 11 August 1993 (1993-08-11) column 8, line 19 - line 56 figures 1-3 ---	1
A	EP 0 562 181 A (KRAUSS MAFFEI AG) 29 September 1993 (1993-09-29) column 6, line 15 - line 44 ---	1
A	US 5 674 541 A (SVOBODA BRUNO) 7 October 1997 (1997-10-07) column 4, line 63 - column 5, line 10 figure 3 ---	1
A	GB 843 328 A (NATIONAL AUTOMATIC TOOL COMPANY) 4 August 1960 (1960-08-04) page 3, column 1, line 7 - line 31 figure 2 ---	1
-/--		

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

G document member of the same patent family

Date of the actual completion of the international search

29 August 2000

Date of mailing of the international search report

05/09/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentaan 2
NL - 2280 HV Rijswijk
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Authorized officer

Alink, M

INTERNATIONAL SEARCH REPORT

Intern Application No

PCT/EP 00/03723

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PATENT ABSTRACTS OF JAPAN vol. 011, no. 125 (M-582), 18 April 1987 (1987-04-18) -& JP 61 268423 A (MATSUDA SEISAKUSHO:KK), 27 November 1986 (1986-11-27) abstract figures 1,2 ---	1
A	DE 42 43 735 A (NISSEI PLASTICS IND CO) 1 July 1993 (1993-07-01) column 5, line 18 -column 5, line 67 figures 1,2 -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern Application No

PCT/EP 00/03723

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0554662	A	11-08-1993	JP 5192756 A	03-08-1993
			JP 5192757 A	03-08-1993
			JP 5192755 A	03-08-1993
			DE 69303381 D	08-08-1996
			DE 69303381 T	05-12-1996
			US 5325908 A	05-07-1994
EP 0562181	A	29-09-1993	DE 4209392 A	30-09-1993
			AT 135957 T	15-04-1996
			DE 9218831 U	14-09-1995
			ES 2085547 T	01-06-1996
			JP 6015709 A	25-01-1994
			US 5336462 A	09-08-1994
US 5674541	A	07-10-1997	WO 9422654 A	13-10-1994
			AT 170127 T	15-09-1998
			AU 6369394 A	24-10-1994
			DE 59406781 D	01-10-1998
			EP 0693024 A	24-01-1996
GB 843328	A		NONE	
JP 61268423	A	27-11-1986	NONE	
DE 4243735	A	01-07-1993	JP 2704572 B	26-01-1998
			JP 5177643 A	20-07-1993

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To:

GIUGNI, Valter
PROPRIA S.R.L.
Via Mazzini, 13
I-33170 Pordenone
ITALIE

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Rule 71.1)

Date of mailing (day/month/year)	02.03.2001
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Applicant's or agent's file reference SIPA/99/192	IMPORTANT NOTIFICATION
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International application No. PCT/EP00/03723	International filing date (day/month/year) 26/04/2000	Priority date (day/month/year) 04/06/1999
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Applicant SIPA S.P.A.


1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

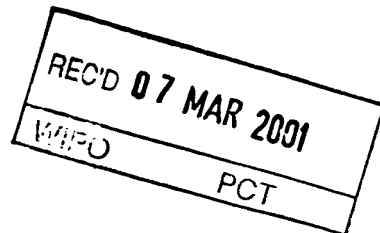
Name and mailing address of the IPEA/	Authorized officer
---------------------------------------	--------------------

 European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Langhoff, M Tel. +49 89 2399-8221
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PATENT COOPERATION TREATY

PCT



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

3

Applicant's or agent's file reference SIPA/99/192	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP00/03723	International filing date (day/month/year) 26/04/2000	Priority date (day/month/year) 04/06/1999
International Patent Classification (IPC) or national classification and IPC B29C45/67		
Applicant SIPA S.P.A.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 4 sheets, including this cover sheet.

- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 11/12/2000	Date of completion of this report 02.03.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Dorfschmidt, E Telephone No. +49 89 2399 2915



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP00/03723

I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).)*:

Description, pages:

1-9 as originally filed

Claims, No.:

1-7 as originally filed

Drawings, sheets:

1/7-7/7 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP00/03723

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-7
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-7
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-7
	No:	Claims	

2. Citations and explanations
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP00/03723

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. All documents, listed in the Search Report, do not disclose a hydraulic press according to the features of claim 1. Nowhere in the documents are mentioned the claimed plunger piston with its upper cylindrical part and its lower part of different diameter and the through-bore in the guide column.
2. As there is given no hint to the specific constructional details of the subject-matter of claim 1, it seems to fulfil the requirements of Article 33 PCT with respect to novelty and inventive step.
3. Dependent claims 2 to 7 are concerned with further details of the invention and seem likewise to be novel and inventive.

Re Item VIII

Certain observations on the international application

1. The 'appropriate means (17)', specified in claim 1, line 26, are an expression of a vague meaning. It should be amended by an more technical expression.
2. The passage on page 5, line 29, should be read as 'cylinder 3'.

PATENT COOPERATION TREATY

PCT

NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU

To:

GIUGNI, Valter
Propria S.r.l.
Via Mazzini, 13
I-33170 Pordenone
ITALIE

Date of mailing (day/month/year) 14 December 2000 (14.12.00)		IMPORTANT NOTICE	
Applicant's or agent's file reference SIPA/99/192			
International application No. PCT/EP00/03723	International filing date (day/month/year) 26 April 2000 (26.04.00)	Priority date (day/month/year) 04 June 1999 (04.06.99)	
Applicant SIPA S.P.A. et al			

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:
- US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:
- BR,EP,JP

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on 14 December 2000 (14.12.00) under No. WO 00/74921

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer J. Zahra Telephone No. (41-22) 338.83.38
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